

## ANALYSIS OF STUDENTS' LEARNING DIFFICULTIES IN PROTIST MATERIAL

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### ABSTRACT

This study aims to determine learning difficulties based on students' understanding of protist material for class X IPA in SMA Negeri in Deli Serdang Regency, North Sumatra Province, and the main factors causing students' learning difficulties. The research method used in this research is descriptive quantitative. The sample of this study was taken at random, amounting to five schools. The data collection technique used is a two-tier multiple-choice diagnostic test instrument to identify students' learning difficulties and a questionnaire instrument to determine the causes of students' learning difficulties. The results showed that learning difficulties from the highest to the lowest were analyzing the basic grouping of protists, understanding how protists reproduce, recognizing protist objects, explaining the morphological characteristics of protists, and understanding the role of protists in protists life and grouping protists into several classes. The main factors causing student learning difficulties are the facilities and infrastructure and the nature of the protist material. Good planning of practicum activities, selection of appropriate learning methods, and linking learning to everyday life must be done by teachers to help overcome student learning difficulties.

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## INTRODUCTION

Biology is one of the most popular branches of science. [Ahmed and Abimbola \(2011\)](#) stated that students still have difficulty learning some of the subject matter. [Raida \(2018\)](#) revealed that the most challenging biological materials are the regulatory, respiratory, and reproductive systems. Meanwhile, [Etobro and Fabinu \(2017\)](#) found that the reproductive system in plants, conservation, material cycles, and ecology are the most difficult materials for students to learn. Furthermore, [Hadiprayitno et al. \(2019\)](#) explain that students have difficulty studying bacteria and viruses, the endocrine system, and genetics. Some of the causes of students' difficulties in mastering biology material are extensive and abstract subjects, unprofessional biology teaching teachers, unavailability of laboratories, low student willingness and interest in learning, limited time allocation, lack of learning resources and teaching aids ([Cimer, 2011](#); [Agboghoroma and Oyovwi, 2015](#); [Chavan, 2016](#)).

A preliminary study has been carried out to reveal the perceptions of teachers and students in class X science for all subjects contained in the odd semester of 2019/2020 TP. It is known that the most challenging material to learn in class X odd semester is protists. This preliminary study was strengthened by examining the documents for the average score of students' daily tests on protist material classified as low, namely 61. Students revealed that Latin language, teacher teaching skills, abstract material, and lack of laboratory facilities were factors causing students' low interest in learning. Protists. The teacher mentioned that the selection of media and the determination of learning hours were the cause of difficulties in learning protist material.

According to Fauzi and Mitalistiani (2018), protists are the most challenging material for class X students to learn because they are abstract, have too many concepts and terms that are not understood, and have difficulties understanding the material's content. Understanding how protists reproduce and recognizing the characteristics of animal-like protists is the most challenging indicator due to the lack of facilities

and infrastructure, motivation, study habits, interests, learning media, and learning resources ([Sukiya and Sudarsono, 2017](#); [Riki et al., 2018](#)).

Students' learning difficulties must be detected so that teachers find it easier to overcome them. Diagnostic tests are one way that can be done to determine precisely the difficulties faced by students (Sudijono, 2013). This study aims to determine learning difficulties based on students' understanding of protist material for class X IPA in SMA Negeri in Deli Serdang Regency, North Sumatra Province, and the main factors causing students' learning difficulties.

## METHOD

The research method is descriptive with a quantitative approach with the population was 20 public high schools in Deli Serdang Regency. The research sample consisted of five schools, namely SMA Negeri 1 Galang, SMA Negeri 1 Labuhan Deli, SMA Negeri 1 Pancur Batu, SMA Negeri 1 Sunggal and SMA Negeri 2 Percut Sei Tuan. The number of the participant as many as 411 students. Samples were taken using a simple random sampling technique.

The data collection instrument used a two-level diagnostic test that was compiled based on indicators from the syllabus in Class X IPA SMA and modifications from [Sukiya and Sudarsono \(2017\)](#) and [Riki et al. \(2018\)](#). This instrument is used to determine the level of students' understanding of 20 items. This study's definition of learning difficulties is students who have misconceptions and do not understand the concept. To reveal the difficulties of learning, a questionnaire with Guttman scale arranged according to the grid listed in Table 1 based on the modifications of [Cimer \(2011\)](#), [Agboghoroma and Oyovwi \(2015\)](#), and [Chavan \(2016\)](#). Guidelines for scoring diagnostic test instruments based on [Bayrak \(2013\)](#) and interpreting diagnostic test results based on [Tarakci et al. \(1999\)](#). Questionnaires are only given to students with scores below 70. The percentage of learning difficulties uses the formula 1.

$$\% \text{ learning difficulties} = \frac{\text{number of students who have misconception and don't understand the concept}}{\text{Total number of students}} \times 100\%$$

**Table 1.** Questionnaire Grid of Causes of Difficulty in Learning Protist Material

No	IndiCator	Sub-indiCator	Item question
1	The nature of the subject matter	Memorization	1
		Abstract	1
		Latin language	1
		Easy to remember	1

No	IndiCator	Sub-indiCator	Item question
2	Teacher's teaching style	Teaching strategy	2
		Teaching method	2
		Teacher mastery	1
		Learning Media	1
3	Student study habits	Motivation	4
		Interest	3
4	Facilities and infrastructure	Practical Activities	1
		Practical tools and materials	1
		Study time at School	1
Total item			20

## RESULTS AND DISCUSSION

The percentage of learning difficulties for each learning indicator is shown in table 2. Based on table 2, the greatest learning difficulties are in indicator 3, and the lowest is in indicator 4. The students' difficulties in classifying protists align with the research of [Riki et al. \(2018\)](#), where 73.53% of students have difficulty classifying plant-

like protists. This difficulty is thought to be due to a lack of understanding of the concept of these indicators. According to [Auliyani et al. \(2017\)](#), to master a concept well, it is not enough to memorize it but must connect one material with other material to be remembered in the long term.

**Table 2.** Percentage of learning difficulties in each indicator of the subject matter of protists

No	Learning Indicator	Average of learning difficulties (%)
1	Describe the morphological characteristics of protists	63
2	Understand how protists reproduce	70
3	Analyzing the basic grouping of protists	77
4	Grouping protists into several classes	58
5	Recognizing protists	64
6	Understanding the role of protists in life	62

In indicator 1, students have difficulty in determining the characteristics of autotrophic organisms. This may be because students cannot distinguish the meaning of organic and inorganic substances based on students' answers. In indicator 2, students have difficulty understanding the reproductive process in *Plasmodium vivax*. In indicator 4, students are not able to recognize the characteristics of Chrysophyta and Phaeophyta. In indicator 5, students have difficulty recognizing the characteristics of *Plasmopora viticola*. This may be because students do not know the scientific name of protists, so they are wrong in choosing the answer. [Zunitasari et al. \(2016\)](#) stated that the difficulty of learning to recognize the characteristics of protists can be caused by the breadth of the material, the lack of understanding of the organelles possessed by protists, and the similarity between the objects studied so that students find it difficult to distinguish them. Difficulties in understanding scientific names can be caused by the many scientific names in protist material, not knowing the meaning or origin of scientific names, complexity in pronunciation, and

differences between writing and speech ([Zunitasari et al., 2016](#); [Amri and Jafar, 2016](#)). In indicator 6, students have difficulty understanding the role of protists that can reduce dissolved oxygen levels to disrupt aquatic ecosystems. This may be due to the limited information possessed by students ([Kurniawati, 2019](#)). In indicator 3, students cannot analyze the differences in characteristics for each group of Protists. Students have difficulty understanding the basic concepts of classifying plant-like protists because of their shared understanding of these indicators ([Riki et al., 2018](#)).

The results of the questionnaire regarding student learning difficulties are presented in Figures 1 and 2. Figure 1 shows that facilities and infrastructure are the highest factors that cause learning difficulties. Meanwhile, the teacher's teaching style is the lowest factor. Figure 2 shows that the cause of learning difficulties in the indicators of the nature of the subject matter is the highest in the abstract aspect of the material, while the lowest is in the Latin language aspect.

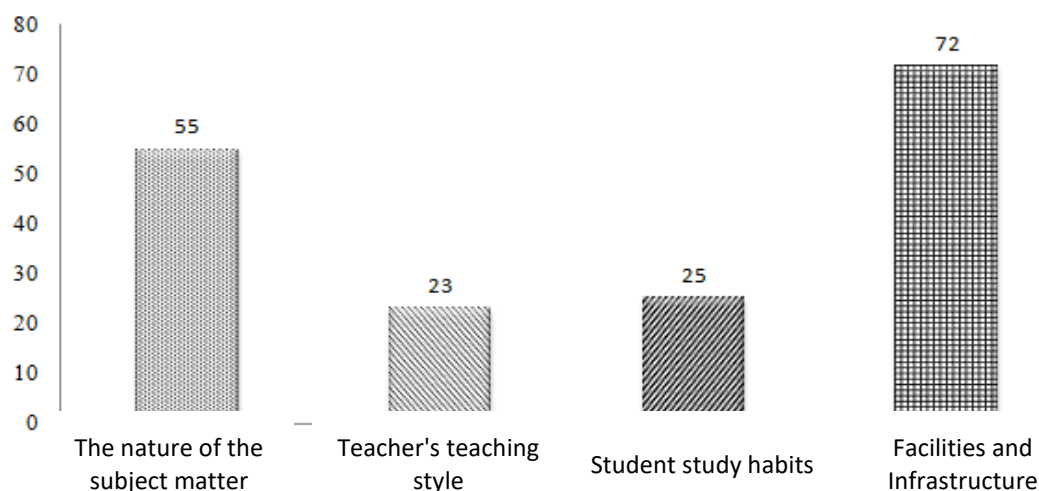


Figure 1. Factors that cause learning difficulties in protist material

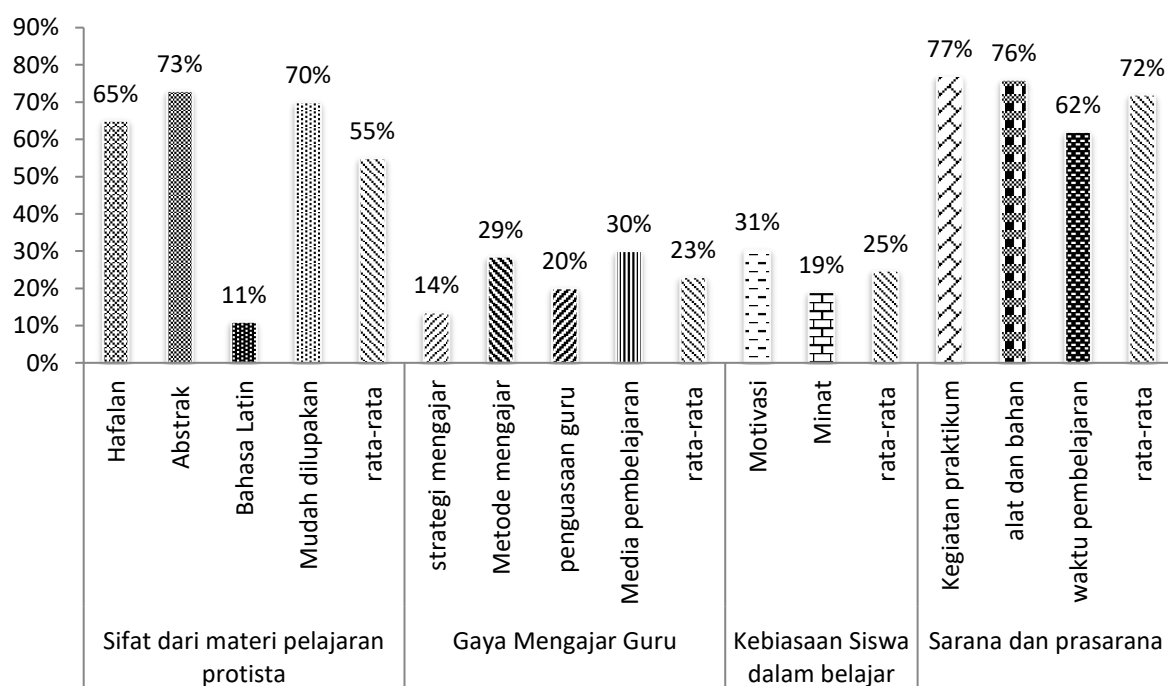


Figure 2. Factors that cause student learning difficulties for each indicator

The protist material contains a lot of Latin, while the object being studied cannot be observed, so that students are required to memorize more than see the object directly. Mukaromah et al. (2012) stated that students' difficulties in learning protists were due to too many terms. Latin terms or Latin are widespread in biology subject matter and are concepts that have been agreed upon by biologists (Rustaman, 2005). In addition, the material protists are also quite a lot so that students are challenging to remember all the material. Shabania et al. (2015) explained that protist material is abstract because the object studied is microscopic, so students find it

challenging to learn it. Furthermore, Sudarman (2007) stated that the learning process still prioritizes remembering a subject matter.

In the teacher's teaching style indicator, learning media is the highest and the lowest in the teaching strategy aspect. In teaching, the teacher must master the material well where the teacher always conveys the material accompanied by examples and always answers questions given by students. However, the media used when teaching protist material is less varied and not related to everyday life. The teacher's inability to relate the material being taught to everyday life can cause students to become disinterested in the teacher's

explanations in class. This can be the cause of students experiencing learning difficulties. According to [Ritonga \(2016\)](#), the teacher's teaching skills in the classroom are the center of influence for most students' concentration. The low skill of teachers in explaining certain aspects of the indicators will make it difficult for students to understand the topic ([Sani et al., 2019](#)). According to [Arfianti et al. \(2014\)](#), the teacher's teaching style is essential in determining student success because it contributes significantly to student learning outcomes.

Aspects of the cause of learning difficulties from the indicators of students' habits in learning, the highest is on motivation while the lowest is on interest. The habit of students in learning is a pattern of learning behavior that is carried out by students continuously on a regular and regular basis. Students' habits in learning consist of two aspects, namely motivation and interest. Based on the questionnaire results, it is known that students pay attention to the teacher when teaching, write down information that is considered important, complete the tasks given by the teacher and discuss with their friends. However, students did not routinely repeat the protist material learned at home and did not seek additional learning resources other than the learning resources used at school. Students feel happy when the teacher is not present at the protists lesson. Study habits will be embedded in students, which can be seen in learning activities to affect biology learning achievement ([Samben, 2014](#)). The right way of learning and is usually done regularly and continuously will help achieve high learning outcomes (Berutu & Tambunan, 2018).

The cause of the difficulty of the indicators of advice and infrastructure in protist learning is the highest in the aspect of practicum activities and the lowest is in the aspect of learning time. Information from the research questionnaire shows that students have never used the laboratory for protist material. This is due to the lack of tools and the availability of practicum materials. The results of this study are in line with [Sukiya and Sudarsono \(2017\)](#), who said that students had difficulty observing protist species directly in the laboratory because of the lack of facilities and infrastructure. [Sani et al. \(2019\)](#) confirm that practicum activities cannot occur because the teacher does not prepare the material properly, so students are forced to imagine. Learning activities in the laboratory aim to make students understand facts and formulate concepts in real terms. According to [Jago \(2010\)](#), practicum classes will get better results and improve critical thinking skills than classes that do not carry out

practicum. According to [Suryanti et al. \(2019\)](#), time is the most significant cause of delays in implementing models, strategies, techniques, or learning methods.

## CONCLUSION

Learning difficulties in protist material starting from the highest to the lowest are analyzing the basic grouping of protists, understanding how protists reproduce, recognizing protists objects, explaining the morphological characteristics of protists, understanding the role of protists in life, and grouping protists into several classes. As a supporter of practicum activities and the abstract nature of protist material, the laboratory is the main factor causing learning difficulties.

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